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ABSTRACT

An informal consortium was formed in 1983 by five postsecondary educational institutions and the educational television authority in British Columbia to cooperate in using audio teleconferencing for course delivery, and to conduct a pilot project between September 1983 and May 1984. The consortium members (Simon Fraser University, British Columbia Institute of Technology, the Open Learning Institute, the University of Victoria, and the University of British Columbia) have pooled audio teleconferencing equipment, staff, and facilities to improve province-wide services and to reduce operating costs. Each institution operates independently, confirming only that equipment and facilities are available. The choice of programs and how the teleconferencing is used by an instructor varies among institutions. Use of audio teleconferencing as a delivery mode has risen sharply since September 1983, with the greatest use being in continuing professional education, often in cooperation with professional societies. The results of teleconferencing activities since the inception of the consortium have been encouraging, and the consortium anticipates an expansion of the system from its present 23 sites to 35 in 1984/1985 and continued expansion by a minimum of 25% in hours of use by June 1985. A map showing the locations of British Columbian teleconferencing centers is included. (Author/LMM)

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A CONSORTIUM FOR EDUCATIONAL AUDIO TELECONFERENCING IN BRITISH COLUMBIA

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ABSTRACT

Five post-secondary educational institutions and the educational television authority in British Columbia formed an informal consortium in 1983 to cooperate in using audio teleconferencing for course delivery. Consortium members have pooled audio teleconferencing equipment, staff, and facilities to improve province-wide services and to reduce operating costs. This paper describes the organization of the consortium, the background to its formation, the experiences of the members, results and future directions. Use of audio teleconferencing as a delivery mode has risen sharply since September 1983 with the greatest use being in continuing professional education often in cooperation with professional societies. The consortium anticipates an expansion of the system from its present 23 sites to 35 in 1984/1985 and continued expansion by a minimum of 25% in hours of use by June 1985.

INTRODUCTION

Audio teleconferencing by post-secondary institutions is growing rapidly on Canada's west coast. An informal consortium for educational audio teleconferencing in the province of British Columbia will complete its pilot year of operation at the end of April 1984. The goals of this group are fairly simple and straightforward. The institutions involved are committed to pooling resources and expanding educational services at a reasonable cost to distant learners throughout the province, while maintaining the variety and flexibility in programming that currently exists in post-secondary education. Such cooperation in a time of restraint continues to be encouraged at all governmental and institutional levels.

British Columbia's 366,000 square miles contain some of Canada's most spectacular scenery. Located astride a half-dozen major mountain ranges, and including a large island, transportation is difficult and expensive. Greater Vancouver is British Columbia's major urban area and contains over half the provincial population, with a smaller urban concentration in the Victoria area. The remaining population is scattered in small cities, towns and individual homesteads over the vast and rugged British Columbia landmass. All this causes great difficulty in the provision of educational services with some equity across the province.

The three universities are located in the major urban areas: the University of British Columbia and Simon Fraser University in the Vancouver area and the University of Victoria on the Island. The British Columbia Institute of Technology is also in Greater Vancouver. In addition, there are 15 regional colleges in B.C. which offer, in addition to college programs, one or two years of university work in a number of disciplines. Following this, the students may complete degree work at one of the universities. The Open Learning Institute provides a broad range of correspondence courses, from audit education to university level throughout the province, and the Knowledge Network of the West operates an educational television channel distributed by satellite.

The establishment of an informal administrative and equipment consortium has allowed institutions to use audio teleconferencing which they would otherwise not have been able to, given the prohibitive cost of deploying receive equipment throughout an area that is 860 km wide by 1,200 km long (540 by 750 miles).

This paper will present a descriptive study of this informal consortium, the participating institutions use of the system during the pilot period, and some thoughts on the future directions of audio teleconferencing in British Columbia.

HISTORICAL PERSPECTIVE

Educational audio teleconferencing as a regular method of delivering courses to off-campus students has only been available in British Columbia since September 1982. However, educational institutions have been experimenting with telecommunications as a delivery mode for the past eight years. In 1976 the Distance Education Department of the British Columbia Institute of Technology (BCIT) developed a twelve week course that was delivered by telephone company-provided audio teleconferencing to nine small, widely-scattered communities on the north end of Vancouver Island. Approximately sixty people met for three hours on each of the twelve nights. Resident experts drawn on a rotational basis from the nine communities led the seminars. The concept was effective with most participants agreeing that it had been a useful experience even though the audio levels were lower than most would have liked. The programmers decided that, until the sound quality

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could be improved and the line charges reduced, audio teleconferencing would be of limited use for reaching students in remote communities.

In 1977, the British Columbia Ministry of Education, in cooperation with the Canadian Department of Communications, used the communications satellite Hermes (earlier known as the Communications Technology Satellite) to experiment with direct broadcast television to, and satellite returned audio from five of the larger population centers in British Columbia. Radio telephones were used to return the audio from a sixth center, a remote logging camp. Most of the province's educational institutions in cooperation with hospitals and libraries conducted a wide range of educational and public information experiments through the fall. When the experiments were complete, an informal consortium of experimenters and the Ministry of Education developed a proposal to the Department of Communications to conduct a longer experiment on the Anik-B satellite which was expected to be available in 1978 or 1979. The proposals led to the Distance Education Department of BCIT being contracted in 1979 by the Ministry of Education to develop and manage an eight month experiment in satellite delivered, interactive, instructional television. Programming originated in Vancouver and was received in ten centers in British Columbia and one in Yukon. The satellite's transmit and receive equipment was stationed at seven separate colleges and institutes which formed an operating consortium of relatively equal partners coordinated by BCIT.

The project grew from 14 hours of live, interactive, televised instruction in October 1979 to 42 hours a week in January 1980. During the eight months, 19 separate organizations had become continuing or temporary members of the consortium developing an awareness of the potential of telecommunications for delivering educational programs and making the personal contacts that were essential for the operation of an informal consortium. The experiment was extended to September 1980 when the newly created Knowledge Network of the West (KNOW) began to coordinate and direct all educational television delivery in B.C. KNOW negotiated further extensions of the experiment time on Anik-B and later transferred to Anik-C, purchasing its time like any commercial user. KNOW gradually accessed cable and low-power re-broadcast facilities and created a hybrid closed circuit and broadcast one-way delivery system. Students who wish to speak with instructors during the live portions of a broadcast now do so through toll-free dial access. The loosely organized consortium that was effective during the experimental period has been replaced by a series of committees advisory to KNOW. The most significant change for educational programmers has been in the openness of access to courses by prospective students. It is now not possible to restrict access to the educational programs to only those persons who are fully registered as fee paying students. While the openness of the system provides excellent public relations for institutions, fee revenue has generally dropped. Some programmers no longer use KNOW because of concerns of confidentiality or of royalty conditions on their purchased course materials.

In 1982, an accidental discovery by BCIT of an audio bridging system in a local radio station led to an agreement between BCIT and the radio station's parent company, Western International Communications Ltd. of Vancouver, to test a prototype bridge at BCIT and to produce portable receive station equipment (amplifier/speaker and four microphones). The use of the teleconference system grew rapidly in 1982 and 1983 as continuing education programmers who had been part of the original Anik-B consortium rented more and more time on the BCIT bridge, shipping rented equipment to receive sites as needed. In all cases, the programmers were directing their courses to specialized fee-paying groups in up to ten different locations. Although there is a higher cost for using the audio teleconferencing system than the publicly supported KNOW system, audio teleconferencing is growing very rapidly because of greater flexibility in scheduling and much higher fee revenue.

	1982/83	1983/84
Individual teleconferences	155	192
Total hours of teleconferencing	223	467
User contact hours (estimated)	16,300	78,000

As the use of the audio teleconferencing system grew, programmers quickly realized that the rental receive equipment (moderators) was spending more time in transit to the different sites than being used for teleconferencing. After a review of the 1982/1983 academic year, BCIT suggested to other users that an informal consortium should be formed to share whatever resources each could contribute for improving the level of educational audio teleconferencing in British Columbia.

CONSORTIUM STRUCTURE

The consortium is an informal association of educational institutions whose main use of audio teleconferencing is to deliver continuing education to off-campus students. Agreement to form the consortium was made at the operating staff level in September 1983. There are no formal inter-institutional agreements or legal ties other than an exchange of letters of intent. As soon as those institutions (BCIT, Simon Fraser University, and the University of Victoria) who had audio teleconferencing equipment or remote classroom sites agreed they could pool their resources, other organizations (Open Learning Institute, University of British Columbia and KNOW) who had a special programming or coordinating interest in distance education, were invited to join the consortium discussions. The group agreed to conduct a pilot project between September 1983 and May 1984. The goal of the project was:

- to provide a cost-effective, province-wide audio teleconferencing service through pooling and coordination of resources.

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Objectives agreed to were:

- to develop an inter-institutional process for sharing audio teleconferencing systems.
- to determine if audio teleconferencing is a cost-effective method for delivering post secondary programs in British Columbia.
- to determine the level of user acceptance of audio teleconferencing in British Columbia.
- to introduce new users to audio teleconferencing.
- to explore new ways of using audio teleconferencing.

Individual users in the consortium had their own objectives, some of which were:

- to reduce operating costs.
- to increase the number of easily accessible receive sites.
- to generate increased revenue.
- to reduce time required to organize individual teleconferences.

The equipment pooled in the consortium is two identical, 10-line operator-controlled bridges in Vancouver, one at BCIT and one at Western Communications, and another under testing at the University of Victoria. Twelve moderators are stored in larger communities, usually at regional colleges, and 11 speaker-phones are stored in an additional 11 secondary centers. Permanent operators are located at BCIT and Western. The coordination of equipment and schedules is handled at BCIT. Consortium members are free to use any equipment within the system not already scheduled. A record of usage is maintained and bridge rentals are cross charged monthly. The use of all other equipment is balanced and accounted for quarterly.

Each institution in the consortium operates independently, confirming only that equipment and facilities are available. The choice of programs and how the teleconferencing is used by an instructor varies among institutions. A summary of each institution's current activities follows.

INSTITUTIONAL EXPERIENCE

Simon Fraser University

At Simon Fraser University, teleconferencing is presently being used by the Faculty of Education in its extensive program for students and teachers throughout the interior of British Columbia. Teleconferencing is still in the exploratory stage and the three activities described are quite different. The first is a series of sessions on microcomputers for teachers, the second enhances a credit course being offered by correspondence and the third concerns program administration. All took place during 1983.

"Microcomputers in B.C. Schools" was a four-part series of ninety-minute sessions chaired from SFU with six other sites participating. About 40 participated each time and there was a mix of secondary and primary school teachers, administrators and librarians. The chairman was an expert in the topic of the day. Microcomputers was a "hot" item in the schools and teleconferencing offered a way to exchange experiences with this new technology right across the province without extensive and expensive travel. Each site had a coordinator, pre-conference materials were distributed and technical problems were minimal. Most participants rated the teleconference process itself highly so that it was the level of satisfaction with content which dictated overall reactions to each session.

Satisfaction with the instructional seminar associated with the correspondence course "Classroom Management and Discipline" was also high. This sixty-minute session gave 42 students scattered over 13 sites in B.C. and two sites in Alberta an otherwise unavailable opportunity to meet each other and the instructor. Only three sites had more than one person in attendance. The two bridges from BCIT and Western were interconnected for this teleconference and a mix of hand sets, speaker-phones and conveners (from a variety of manufacturers) was used without technical problems.

In another teleconference as an alternative to flying the University's five off-campus secretaries to Vancouver, a sixty-minute teleconference allowed group discussion of site administration. This meeting provided for both the exchange of problems and solutions and coordination with the University. All participants agreed the teleconference was highly cost-effective.

In the future, the Faculty of Education plans the continuing use of audio teleconferencing, particularly in light of on-going budget reductions as an alternative to flying instructors and administrators to and from Vancouver. Experience has shown that pre-meeting materials, a detailed agenda, well-chaired sessions, and specific protocols are important, as is a technical test prior to each session.

British Columbia Institute of Technology

The British Columbia Institute of Technology is a two-year institution offering diploma programs in business, engineering and health to approximately 4,000 full-time students each year. BCIT has had a strong continuing education program since 1964 and a distance education service since 1974. It has deliberately experimented with new methods of reaching off-campus students for the past eight years. The Distance Education Department is responsible for the operation of the audio teleconferencing bridge and for developing widespread audio teleconferencing expertise within the institution. Approximately 4,000 students are registered each year in a variety of part-time off-campus programs. Many of the students are on employer-supported engineering and health related programs. Approximately 3,000 are in independent study courses. Audio teleconferencing is used for:

- teletutoring enrichment in selected courses with generally one to three people per site.
- instructor contact before, during and after KNOW broadcasts.

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- short, single-concept seminars supported with print packages.
- linking disabled homebound students w th regular campus classes.
- a variety of administrative and program development meetings.

The BCIT Teleconferencing Center has approximately $25,000 a year in fixed operating costs. Time not used by members of the consortium is sold to a variety of contract users, mainly professional societies for their continuing education programs. Users believe they have demonstrated very significant cost savings, user acceptance, and a revenue generation potential while maintaining educational standards.

BCIT AND CONTRACTOR USE - 1983/84

	No. of Events	Total Hours	Users Reached
Teletutoring	8	76	45
Short Seminars	35	64	950
Day-Long Seminars	16	132	2730
Meetings	6	15	45

Open Learning Institute

The Open Learning Institute has begun, over the past year, to use audio teleconferencing for administrative and instructional purposes. Academic advisors located in the seven regional advising centers and course tutors in their homes have used audio teleconferencing for staff meetings, professional development seminars and course planning.

Course tutors have also held audio teleconferencing seminars immediately following television broadcasts over KNOW. Their purpose has been to discuss and clarify issues arising from the broadcast. As expected, other course-related issues have also been raised. In one case, a learner who was ready to withdraw from a course did not after getting support and encouragement from other learners. Despite the positive cases, the experience of OLI thus far has indicated that most home learners are reluctant to phone at a designated time for an optional teleconference. An evaluation planned for the project described in this paper will examine the issue more closely.

University of Victoria

The University of Victoria has placed special emphasis on serving learners throughout the province. Despite the geographic and climatic conditions of British Columbia, the University of Victoria's Division of University Extension has developed an extensive off-campus program offering a variety of courses throughout B.C. Moving from face-to-face instruction and expanding to correspondence-based courses with tutorials in 1978, the University of Victoria has steadily diversified its means of course delivery. The Anik-B satellite was used experimentally to deliver both degree and professional development courses. Audio feedback by telephone in that project was an important innovation allowing students to "phone in and talk" to the instructor live on the air. This course delivery model has continued using the facilities of the Knowledge Network. Recently, a different approach to interaction has been adopted. The major portion of audio interaction between student and instructor occurs off air after the televised programs through the use of teleconferencing.

In addition to this mixed media approach, the University is offering courses based on audio teleconferencing, with extensive print materials as the primary educational technologies involved. As television broadcast time becomes more and more scarce and difficult to schedule, this latter approach has increasing appeal.

In January 1983, given the anticipated need at the University of Victoria and its distance from Vancouver, the decision was made to acquire a 10-port audio teleconferencing bridge. At present, the University is testing a variety of products to determine which is best suited for present and anticipated programming needs. Some technical problems of static on lines, gain control and clipping are still to be solved.

The University's involvement with the informal audio teleconferencing consortium has provided the access to hardware, particularly at the receive sites, and an organizational model which allows for increased and more effective course delivery throughout the province.

The University of Victoria utilized the audio teleconferencing for 11 one-hour sessions in eight separate locations throughout the province during the pilot period of operation.

Despite the initial technical difficulties associated with the testing of various bridging equipment as described above, the results have proved more positive than negative. Comments on the student evaluation forms indicate most were prepared to give teleconferencing a chance and by the end of the courses most felt it was an acceptable, effective way to receive instruction.

In terms of integration with live interactive systems, both off air and on air, the experience has been more uniformly rewarding. Students have reacted positively to holding a "private" conversation off air with the instructor and a variety of fellow students.

In the future, the University of Victoria sees continued and expanded use of audio teleconferencing, when the technical difficulties can be overcome, in the areas of course delivery, practicum seminars in the professional development fields and tutorial support to students.

In addition, the integration of computer conferencing and audio teleconferencing holds exciting possibilities for distant learners in B.C.

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University of British Columbia

At the University of British Columbia, the major user of teleconferencing has been the Division of Continuing Education in the Health Sciences. CEHS provides professional development programs for practicing health professionals such as physicians, dentists, pharmacists, nurses and dietitions.

In March 1983, an interprofessional audio teleconference was held that was jointly sponsored by Continuing Pharmacy Education and Continuing Education in Nutrition and Dietetics. Due to the success of that pilot program, it was decided to offer two separate programs in the spring of 1984. Continuing Pharmacy Education provided a series of lectures that involved 18 different communities in British Columbia. The program included a speaker who lectured from his home base at Washington State University in Spokane, Washington. Continuing Education in Nutrition and Dietetics offered a series of lectures on nutritional biochemistry that had registrants from nine B.C. communities.

Physicians in the province are also starting to enjoy the benefits of audio teleconferencing. In addition to lectures offered through the Royal College of Physicians and Surgeons from Toronto, Continuing Medical Education at UBC is presenting a series of audio teleconferences this spring for family physicians. Plans are also underway to tap into a series of live lectures held in Vancouver and to extend them to other communities through audio teleconferencing.

As universities continue to be affected by cutbacks in operational budgets, teleconferencing will play a larger role in distance education programs for many faculties. It will provide more people in the province access to a greater variety of course offerings and educational opportunities.

The equipment and facilities made possible through the consortium have served to introduce many new users to teleconferencing in B.C. at a relatively low cost. This will likely lead to increased activity and new applications on a regional basis within the province.

Results

The results of teleconferencing activities since the inception of the consortium have been encouraging. More hours of teleconferencing were conducted and are being planned now that equipment and facilities are more easily accessible in many communities in British Columbia. Prior to September of 1983, equipment was transferred from community to community as required in a random fashion. This proved to be very expensive and time-consuming on the part of teleconference planners and site coordinators. However, with specific sites and facilities identified (see map), shipping costs were reduced and less time was required to coordinate programs. This led to a greater number of programs being offered by a more diverse group of users.

From September 1982 to August 1983 there were 1,952 student contact hours of programming recorded by registered students of the educational institutions concerned. (Student contact hours = number of hours of programming x number of participants.) From September 1983 to August 1984 this figure will have increased to an estimated 3,537 student contact hours. This does not include the use of teleconferencing as an adjunct to interactive educational television programs offered by the University of Victoria and the University of British Columbia through the facilities of the Knowledge Network. It also does not take into account teleconferencing offered by professional institutions such as the Certified General Accountants of B.C., the Continuing Legal Education Society of B.C. and the Corporation of B.C. Land Surveyors.

These groups were able to reach many more of their constituents in the province at a dramatically reduced cost than was possible with traditional methods of instruction such as sending instructors to remote locations.

The results of teleconferencing activities will continue to be monitored by the consortium and will be analyzed periodically to detect trends in usage and application.

Case Studies

Administrative Meeting: A professional association with its nine governing council members living and working in widely separate communities holds monthly meetings at Vancouver that normally require overnight travel for five members. The costs to the association are a minimum of $1,200 per meeting. Members meet for 8 to 12 hours each meeting. Teleconferencing has been used for some recent meetings and has reduced the costs to less than $300 for a four hour, five site meeting including one member from Ottawa.

In-Service Training: A Vancouver educational institution offered a lunch time course for "Secretaries Who Supervise". Eight one hour classes involving five sites and ten people were held for a cost of $1,800. Without teleconferencing, the class could only have been held by bringing the students to a central classroom for a single day at an estimated cost of $2,425 for travel and accommodation plus an estimated $950 for value of staff time lost.

Professional Continuing Education: A professional association throughout B.C. regularly conducts updating day-long seminars. A recent Saturday seminar registered 385 students with total fee revenue approximately $43,000. Teleconferencing charges for ten locations for the 0900 to 1630 hour seminar were $2,122. A cost reduction was made by making all long distance connections before the pre-0800 hour, 50 per cent discount rate ended. Delivery costs per student were 74¢ per hour.

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TELECONFERENCING CENTERS IN BRITISH COLUMBIA

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FUTURE DIRECTIONS

The use of audio teleconferencing as a means of delivering instruction to off-campus post-secondary students is clearly increasing rapidly in British Columbia. Over the next few years, the main users will continue to be institutions having a provincial rather than regional mandate. An important new user group that is expected to appear by 1985 is rural community colleges with widely dispersed student populations. All educational institutions in British Columbia are facing reductions in government operating grants but are expected to provide the same or increased levels of service. Administrators will look to easily implemented educational technology for generating student contact hours and new fee revenue. Programmers will use teleconferencing to replace travelling instructors wherever possible.

During 1984/85, at least one institution plans to hire part-time site coordinators either directly or in conjunction with a local college or another member of the consortium. The coordinators would be residents of the most commonly used teleconference centers. Their function would be to handle all on-site activities from registration to operation of receive equipment, thereby reducing the chance of technical error, and promoting the use of teleconferencing in their communities.

Experiments are already being conducted in the transfer of data along with voice information. By 1985 some regular use of computers in audio teleconferences should be a reality.

Professional societies will likely increase their use of audio teleconferencing independently of educational institutions, unless the institutions can provide the specialized, short, up-grading courses and seminars that the societies want for their members. There are indications that non-institutional educational use may dominate the schedule and larger users will purchase their own equipment by 1985.

The present, informal consortium structure will continue to exist only as long as scheduling remains flexible, equipment contributors benefit from the sharing, and diversity in system use remains possible. Any attempts to regulate the consortium activities would likely result in individual equipment owners withdrawing and continuing to operate by renting portable equipment and accessing the public telephone system.

CONCLUSION

Audio teleconferencing can be an important part of educational learning systems for distant students. However, for the maximum cost benefits and accessibility, some form of workable coordination of users and equipment is essential. Informal arrangements for coordination based on communication and trust provide a more workable system, at this time, for British Columbia teleconferencing providers than would a more formal legalistic arrangement.

Biographical Data

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